

HOIST FOR CONSTRUCTION MATERIAL

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FIELD OF THE INVENTION

The present invention relates generally to auxiliary equipment used in the construction industry. More particularly, the invention relates to hoisting of building material in construction sites.

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BACKGROUND OF THE INVENTION

Relocation of building material and associated tools constitutes a substantial effort on behalf of a construction team in a construction site. Transferring of building material from unloading locations to sites of consumption, is a mechanized task, often employing cranes and various other mechanical instruments. The present invention provides means for minimizing costs, reducing manpower, increasing speed and simplifying the labour involved in relocation within the framework of a construction project.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a schematic description of a suspended hoist of the present invention;

Fig. 1B is a schematic description of a suspended hoist of the present invention showing an insertion of the sliding wheel on a floor;

Fig. 1C is a schematic description of a suspended hoist of the present invention being lodged on a subtending floor;

Fig. 2A is a schematic description of a preferred embodiment of a suspended hoist of the present invention showing pulley and cable assembly;

Fig. 2B is a schematic description of a suspended hoist of the present invention being lodged on a subtending floor;

Fig. 3 is a schematic description of an embodiment of the invention in which the hook pulley is vertically translocatable suspended from a second pulley and an anchor point. .

DESCRIPTION OF THE PRESENT INVENTION

A hoist in accordance with the present invention is a suspended "C" shaped construction or frame having two substantially parallel arms connected by a cross construction element. The hoist moves both sideways and vertically, directed by a crane. A hoist of the invention is a construction carrying a hook for material loading, and typically a wheel or a sled for sliding on the floor and a cable system for maneuvering the hoist and or controlling loading/unloading. Functionally, the hoist of the invention is applicable in construction sites in which floors are laid sequentially, leaving free access from the flanks. The function is explained in reference to **Figs 1A-D**. In **Fig. 1A** a hoist **50** is shown schematically, in a suspended position, hanging on cable **52** which is linked to a crane (not shown). Cable **54** carries a tray **56** with building material (not shown). Sliding wheel **58** disposed at the front end of the upper arm of the frame points towards floor **60**. This floor and all other floors of the building are held by columns such as column **62**. In **Fig. 1B** the hoist, suspended still on a crane cable, is pushed in the direction of arrow **68**, advancing the hoist over the floor **60**. Concomitantly, the hoist **50** is lowered in the direction of arrow **70**, by the elongating cable **52**, until sliding wheel **58** meets the upper surface of floor **60**. As cable **52** is elongated still further, the entire hoist **50** rotates around sliding wheel **58**, bringing the tray **56** further in the direction of arrows **68** and **70**. In **Fig. 1C** hoist **50** is shown, after maneuvering has ended. Frame **22** of the hoist rests against a support **74**. Cable **52** is no longer required to be tensioned, because the hoist rests firmly against the floor **60**, through the mediation of

support **74**. Generally, however, such support may not be required if the frame of the hoist is made to rest directly against the supporting floor.

A preferred embodiment of the invention is demonstrated, structure and function, with reference to Figs **2A - B**, which shows a structure of a hoist in accordance with a preferred embodiment of the invention. Hoist **80** contains a frame **82**, a sliding wheel **84**, a set of pulleys **86-89** that support cable **90**, a hook **92**, cable fastener **94** and a static frame support **96**. In this figure, the hoist is shown suspended in the air typically carrying a tray of building material (not shown), by hooking on to hook **92**. As can be seen, pulley **88** the pivot of which is connected to frame **82**, is adjacent pulley **89** which has a free pivot only connected to hook **92**. This adjacency is brought about by the tension of cable **90** which, at the top is anchored directly or indirectly to the crane, and at the bottom to fastener **94**. The configuration of pulleys – cable assembly, is changed when the hoist is made to rest on top of a floor. This is shown schematically in Fig. **2B**. Tile **110** represents the floor on which the hoist rests. Once the hoist is lodged on floor **110**, cable **112** can be slackened without affecting the position of the hoist. However, such slackening translates into lowering of hook **114**. As can be seen in the figure, pulleys **116** and **118** are depicted since pulley **118** is not connected to frame **120**, but rather to hook **114**. Tensioning of lifting cable **112** results in hook **114** being drawn up, providing that the force applied is strong enough to lift up the hook and suspended material tray (not shown). Lifting up of the hook may occur until pulley **118** abuts on pulley **116**. If the cable is tensioned further, the hoist may be lifted off the subtending floor providing that the tensioning force can overcome the suspended weight. If the load on the hook is

heavier than a certain limit, the tensioning of the lifting cable may cause uplifting of the entire frame. In such cases, anchoring of the lodged frame to the subtending floor may be required.

In another preferred embodiment of the present invention, an independent winch is located at the bottom arm of the frame of the hoist, providing a means for lifting/lowering the hook. This is explained with reference to Fig. 3. In this embodiment, the cable 150 suspended from the crane is tied statically to the hoist. Reel 152 is actuated by a motor (not shown) which winds cable 154 or leases it such that hook 156 moves up and down in the direction of arrow 158, as actuated by the operator controlling the motor. Cable 154 slides in the route as formed by the pulleys 160 and 162. In another constructional variation of the same embodiment, the lower arm of the hoist is used as a sliding rail track for pulleys that carry the load along. A Mechanical relocation facility along a horizontal track may be useful if precision placement of gear or material is a required.